Minutes of T11 HIPPI SWG, and HNF - Technical Committee (TC)
April 7-8, 1997
Palm Springs, California

(Corrections made, June 10, 1997)

1. Opening remarks and introductions

The Chairman, Don Tolmie of Los Alamos National Laboratory, opened HIPPI meeting and thanked Jeff Stai and Brocade Communications Systems for hosting this meeting. This group is constituted as both the HIPPI special working group (SWG) under T11, and the HIPPI Networking Forum (HNF) - Technical Committee (TC).

Don lead a round of introductions. The list of attendees is at the end of these minutes. Greg Chesson distributed "Super HIPPI" caps to the major players in the group.

2. Review / modify the draft agenda

Draft agendas were distributed via e-mail before the meeting and hard copies were distributed at the meeting.

No changes or additions were suggested. These minutes reflect the approved agenda, although not in the exact order they were covered. Don Tolmie agreed to take the meeting minutes, and solicited notes from other attendees *(my thanks to Greg Chesson ñ Don)*. Note that all of the HIPPI items are in this set of minutes, there are no longer different sets for the different groups, e.g., HIPPI-800, HIPPI-6400, Optical, etc.

3. Review minutes

3.1 February 4, San Jose, meeting

The minutes of the T11 HIPPI SWG ∕ HNF - TC meeting of February 4, 1997, in San Jose were reviewed. Greg Chesson moved, and Bob Willard seconded, to approve these minutes as written. Passed unanimously.

3.2 March 4-6, San Jose, meetings

The minutes of the HIPPI-6400 meeting of March 4-6, 1997, in San Jose is were reviewed. Greg Chesson moved, and Bob Willard seconded, to approve these minutes as written. Passed unanimously.

4. Review old action items

The action items from the February 4, 1997, meeting were reviewed for the current status.

1. Michael McGowen - Generate a HIPPI switch MIB. (Done)

2. Michael McGowen to send Essential's HIPPI switch MIB to Don Tolmie for posting on the HIPPI web page. (Carryover)

3. Jeff Young – Check on the status of the HIPPI end-point MIB, and if Mark Kelley is going to continue work on it. (Done - Mark is continuing)

4. Michael McGowen to coordinate the HIPPI MIB developers. (Carryover)

5. Everyone – Review the HIPPI-6400 MIB. (Carryover)

6. Michael McGowen - Update HIPPI-AC to work with HIPPI-SC and its recent changes. (Carryover)

7. Don Tolmie - Revise HIPPI-FP with the inclusion of a ULP-id for HIPPI-MP. (Overcome by events)

8. Everyone - Suggest changes to HIPPI-FP and bring in proposals for them. (Carryover)

9. Don Tolmie - Shepherd HIPPI-Serial Rev 2.7, HIPPI-SC Revised Rev 3.2, and HIPPI-ATM Rev 1.8, through T11 and the final ANSI approval process. (Done)

10. Don Tolmie - Correct the errors in the December minutes and replace the copy on the web. (Done)

The action items from the March 4-6, 1997, HIPPI-6400 meeting were reviewed for the current status.

1. Greg Chesson to have Art Beckman look into getting a 24-bit organization identifier for HNF's use in ULAs. (Done - passed to HNF since money involved)

2. Greg Chesson and Don Sanders to have SGI review the connector layout in HIPPI-6400-PH as it relates to the SuMAC chip. (Done)

3. Hansel Collins to obtain the driver output impedance values for HIPPI-6400-PH table 9. (Carryover)

4. Hansel Collins to check the shortest HIPPI-6400-PH cable length possible when using the on-board equalizer presently optimized for 50 meter cables. (Done - 10 m)

5. John Ellis and Herb Van Deusen to investigate the possibility of putting the HIPPI-6400-PH passive equalizer networks within the cable assembly, e.g., connector backshell. (Done - see item 5.3.3)

6. Don Tolmie to draft a Service Interface for HIPPI-6400-PH. (Done - see item 5.2)

7. Don Tolmie to update HIPPI-6400-PH with the changes agreed to at the March meeting. (Done)

8. Don Tolmie to draft a Project Proposal and initial HIPPI-6400-OPT draft document. (Project Proposal portion done, document is carryover)

9. Greg Chesson to propose text to replace the HIPPI-ST Notify bit. The intent is to change the polarity of the bit, i.e., to "Mute" or "Suppress" notification of DATA Operations. (Done)

10. Greg Chesson to propose text on the e-mail reflector describing HIPPI-ST Request_To_Receive set up using the Persistent bit. (Carryover)

11. Greg Chesson to draft initial text for HIPPI-ST Block acknowledge/retransmission functions, and consider how long an Originating Source should keep buffers for possible retransmission. (Overcome by events)

12. Greg Chesson and Jeffrey Chung to look at methods for rejecting a HIPPI-ST Request_To_Receive Operation. (Carryover)

13. Greg Chesson and Jeffrey Chung to consider developing "reason codes" to explain why a particular HIPPI-ST Operation was rejected. (Carryover)

14. Jeffrey Chung to verify correctness of HIPPI-ST summary tables 2 and 3 in relation to the text describing the individual Operations. (Done)

15. Jeffrey Chung to finish revising HIPPI-ST Annex C for the next revision of ST. (In process by James Hoffman)

16. Greg Chesson and Jeffrey Chung to draft state tables for HIPPI-ST Operations. (In process)

17. Don Tolmie to update HIPPI-ST with the changes agreed to at the March meeting. (Done)

18. Craig Davidson to update his proposed HIPPI-ST annex for "Translating ST between HIPPI-6400 and HIPPI-FP" with the changes agreed to at the March meeting. (Done)

19. Michael McGowen to review 8.2.1 of HIPPI-6400-SC and propose a fix for when two directly connected end points try to use the same ULA. (Overcome by events)

20. Roger Ronald to update HIPPI-6400-SC with the changes agreed to at the March meeting. (Done)

21. Fred Templin to make a PDF copy of the fabric structure that was used in the HIPPI-6400-SC broadcast discussions at the March meeting. Don Tolmie to put the PDF copy on the web site as an aid for further discussions. (Carryover)

22. Fred Templin, Jeff Young, and Greg Chesson to begin an IP and ARP over HIPPI-6400 RFC. (In process)

23. Don Tolmie to allocate ULP-ids in HIPPI-FP for HIPPI-6400 style ARP, Reverse ARP, and IP. (Overcome by events)

24. Von Welch to contact HIPPI-6400 MIB developers and users for comments on current draft, and to prepare a presentation on the MIB for a future meeting. (Carryover)

25. Don Tolmie to provide an updated HIPPI meeting attendees list. (Carryover)

5. HIPPI-6400-PH

Michael McGowen suggested that we consider changing the name of HIPPI-6400, and suggested something on the order of "T11". Greg Chesson suggested that this was more appropriate for the HNF to address. It was agreed that the ANSI projects should remain as they are, and that the HNF would be free to develop a 'non de market'. Michael McGowen took an action item to take this topic to HNF.

5.1 Review changes from Rev 1.1 → Rev 1.2

The changes in this April 1, 1997 revision were reviewed. Only the contentious issues that generated a lot of discussion are reported here. The service interface, and copper interfaces were skipped over and covered under agenda items 5.2 and 5.3.

Bob Willard noted that the byte numbers were inconsistent in table 1. They will be reduced by one, e.g., bytes 1-32 becomes bytes 0-31, etc. The change

to require that the HIPPI-6400-PH insert any pad bytes, and that the pad bytes be zeros, provoked some e-mail. The decision to require zeros was reaffirmed at this meeting.

There were a fair number of changes to the Reset and Initialize clauses. Several pre-revision copies were reviewed by the SGI folks, so the current copy has already had some good review. At this meeting it was agreed that we need to flesh out the Initialize text similar to the Reset text; it is insufficient to say that Initialize does all the things that Reset does plus propagate. When the hold-off timer is started will also be clarified. Additional changes were made, and will be incorporated in the next revision.

5.2 Service interface (pages 8-11)

The service interface in clause 5 was all new, so a complete read-through was done. Don had based the text on the service interface in HIPPI-FP. It was noted that higher layer Service Interfaces are essentially APIs. The Transfer primitives will be changed to allow concurrent actions on all four VCs, the original text only allowed one at a time. The Transfer primitives will also be modified so that they will be the mechanism used to send and receive Admin micropackets. Don Tolmie took an action item to effect these changes.

5.3 Copper interface (pages 31-36)

Extensive changes were made at the March meeting, and have been incorporated in the document. The local copper interface was moved ahead of the copper cable interface so that the connector and cable specifics could remain towards the end.

5.3.1 Local copper interface to drive optics

The original timing table was split into two parts, one for the 8-bit local interface, the other for the 16-bit copper cable interface. This clause was further discussed with the optics specialists under agenda item 6.4. It was decided that specifying specific resistor and capacitor values for the local interface was inappropriate - the values really depend on the particular ICs and PC board material. Hence, it will be re-written to specify the transfer function that each side would see.

Note 2 in 15.3 was changed to "If the optical receiver does not provide a light-present signal, then the activity monitor input should be statically pulled low." Based on SGI simulation results the T_{PWD} and

T_{JITTER} values were revised downwards. In table10 the first T_{JITTER} parameter was removed. In table 11 all of the Receiver parameters (except for F_{in}) at the bottom of the table were deleted, and the F_{in} parameter moved to the upper portion of the table. Table 11 notes 1 and 2 were also deleted.

5.3.2 Copper cable interface

The text and parameter value changes were reviewed. As in clause 15, the second paragraph of 16.2 was deleted as being dependent on the specific implementation. In table 13 the "0.02% or 200 ppm" notation was removed from the Bit Period parameter, but left on the Bit Peroid Tolerance line. As in clause 15,and based on SGI simulation results, the T_{PWD} and T_{JITTER} values were revised downwards in tables 14 and 15. In table14 the first T_{JITTER} parameter was removed. In table 15 all of the Receiver parameters (except for F_{in}) at the bottom of the table were deleted, and the F_{in} parameter moved to the upper portion of the table. Table 15 notes 1 and 2 were also deleted.

5.3.3 Equalization network in connector backshell

At the March meeting concern was expressed about matching the equalization network to the cable length. Hansel Collins noted that an SGI simulation showed that with only a single equalizer network (optimized for 50 meter cables) located on the board, cables shorter than 10 meters have non-acceptable waveforms. John Ellis and Herb Van Deusen investigated the possibility of putting the equalization network in the connector backshell so that it could be optimized for the cable length and cable parameters. Their conclusion was that it was possible to mount the RC peaking network in the backshell, but the blocking capacitor should remain on the board (putting it in the backshell made cable testing more difficult). It was estimated that it would add about $20 to the raw cost of the cable assembly.

John Ellis requested that the blocking capacitor not be placed in the backshell, so as to aid cable testing. SGI simulations showed that traces up to 8 inches between the connector and the Source driver were acceptable. The group agreed to change the document to specify the RC peaking network in the backshell and the blocking capacitor on the PC board. The values for the peaking network will be cable dependent, the value for the blocking capacitor is still under study. Bill McCoy noted that the output impedance of the Source driver is a critical

parameter, and Hansel Collins took an action item to provide a value (SGI is currently working on a test jig). A transfer function will be specified for the circuit as an aid to the cable designer.

5.4 Plans for forwarding

It had been previously stated that we wanted to forward HIPPI-6400-PH at the June meeting. This would require that the document be complete and ready for an T11 letter ballot by that time. It was realized that there was no hope of meeting this date, and a revised date of forwarding at the August plenary was agreed to. It was stated that we do not feel the need for a complete read-through in committee before forwarding.

6. HIPPI-6400-OPT (Optical)

Greg Chesson volunteered to take the notes for this portion of the meeting. Don Tolmie will produce the final minutes. The minutes will be part of the other HIPPI minutes, i.e., there are no separate HIPPI-6400 Optical minutes. With new people coming into the meeting another round of introductions was done.

6.1 Review minutes from February 4, San Jose, CA

The minutes of the HIPPI-6400 Optical meeting on February 4, 1997, in San Jose, were reviewed. Don Tolmie noted that the notes were taken by Stan Swirhun of Vixel, but Don put out the final minutes and any errors should be attributed to Don.

The minutes were corrected with the following changes. In the second paragraph of Eye Safety, changed "Do not use into..." to "Do not look into...". In the fourth paragraph of Eye Safety, changed "...asked if was sold..." to "...asked if it was sold...". In the next to last paragraph of Connector Selection, changed "...the MPX connector was selected as the optical connector..." to "...the MTP connector was selected as the optical connector...".

Mike Griffin moved, and Chuck Brill seconded, to approve the minutes as corrected. Passed unanimously.

6.2 Eye safety

For some time there has been concern over multiple closely-spaced fibers giving eye safety problems. (See the February minutes for a good discussion.) Nothing new was presented at this meeting.

6.3 Open Fiber Control (OFC)

Steve Joiner presented an approach to OFC based on using the two outside fibers of the ribbon for OFC functions (see the HIPPI web page for a PDF copy of the presentation). This provided a redundant system, and provided good protection against undetected damage to the ribbon edges (the most probable). Steve presented the 4-state machine used in Fibre Channel's OFC and showed how to implement such a machine using two fibers. There was general agreement that the approach looked promising and needed further analysis to determine its robustness and correctness, and to see if there is sufficient redundancy in the design.

Steve also pointed out that Hewlett-Packard prefers tight control of numerical aperture and other parameters to meeting eye safety specs and that working on OFC is strictly a backup strategy that will hopefully not be needed. Steve also helped the non-optical members understand that whereas OFC might look attractive for parallel links, the parallel OFC approach falls apart when one end of a link uses a parallel device and the other end fans out to several singleton devices.

Dan Schwartz pointed out that to make products that are eye safe without OFC it is necessary to control the beam profile coming out of the transmitter. Regardless of the means, be it lenses, waveguides, reflective optics, or controlling the characteristics of the lasers, tight control of the beam profile is a challenge that will inevitably add to the cost of the product. Anything we can do at the IC level is inevitably cheaper. Dan presented a scheme that was similar in intent to the Hewlett-Packard concept, but used a single bi-directional channel rather than multiple fibers (see the HIPPI web page for a PDF copy of the presentation). The scheme used a serial encoding of symbols which when exchanged between endpoints control the progression of the OFC state machine at both ends. Dan was worried about the case where a ribbon was fanned out, making detection on a single open fiber shutting down the whole ribbon impractical.

The OFC connection to the electrical interface specified in HIPPI-6400-PH Rev 1.2, clause 15.3, was reviewed. The requirement for the electrical Source driver to go to a no-light state within 1 microsecond was questioned, and was changed to "within 1 millisecond".

6.4 Electrical I/O specifications

The preliminary electrical specifications, from HIPPI-6400-PH Rev 1.2, clause 15, were distributed and reviewed. PECL signals were specified. There was a lot of discussion on the jitter parameters and how they were measured. It became clear that there were/are important differences in terminology between the optical working group and the electrical group. Steve Joiner and Hansel Collins agreed to work on an improved lexicon. It was discovered that some of the differences in terminology and approach are accounted for by HIPPI-6400 being a single synchronous system whereas the optical working group's background is in less synchronous systems.

During the discussion Hansel Collins stated that the maximum skew allowed by the SuMAC was 8.5 ns, which was in conflict with the 10 ns in 11.1. The skew allowance was changed to 8.5 ns in clause 11.1. The skew tolerance for the optical portion of a link was debated; it must be less than the 8.5 total to allow for skew on the PC boards, electro-optical components, and in the electrical ICs.

In table 9, the "Bit Period" parameter was changed to "Baud Period" with a time of 1 ns. The "Duty Cycle" parameter took some heat; and how it was different from the Baud Period tolerance. This needs more work.

In table 10, the Source driver output was reduced from "1500 - 1000 mVp-p" to "400 - 200 mVp-p" ñ the SuMAC will probably use attenuators to achieve this level.

The Destination receiver input in table 11 was reduced from "500 mVp-p" to "200 mVp-p". There was a big disconnect on the jitter specifications. It was claimed that Fibre Channel has a much higher jitter tolerance than HIPPI-6400. The electrical guys say that the optical designs are pretty junky if they need a 300 ps jitter budget for a 1 ns clock. Further examination revealed that the copper figures do not include clock drift in the jitter specification ñ and argue that this is the correct thing to do. This difference in approaches is another example of the clash between differing backgrounds and assumptions.

6.5 Link Budget

Dan Brown made an adjustment to the proposal he had presented at the February meeting. Dan's assertion was that everyone was trying to avoid OFC. It was noted that our maximum 300 meter fiber distance was not due to power limitations. The group learned that the first and last connectors in a link "are not counted" in the link budget. This caused some consternation at first. Some skepticism was expressed from various corners, starting with Motorola, that the proposed Link Budget was too optimistic and allows no slack for manufacturing. Siemens endorsed the Link Budget proposal as being their design target.

Steve Joiner presented a some slides based on ideas from Mike Dudek of Vixel (see the HIPPI web page for a PDF copy of the presentation). The idea concerned designing lasers with variable extinction ratio as a means of meeting eye safety power levels with a lower cost implementation (by eliminating the feedback photodiode and related circuit for each laser). The non-laser-physicists did not generally understand what was being discussed.

6.6 Review draft Project Proposal

Don Tolmie presented a draft Project Proposal for a new HIPPI-6400-OPT standard, which was reviewed. It was agreed that "mulitmode fiber" should be in 2.2 (Scope), and the FC-PH-3 should be included in the list of existing standards. Requests to add details for the target speeds, feeds, and distances were made, but discouraged as making the proposal too specific and restricting our wiggle room. It was agreed that the modified Project Proposal meet our needs. Don took an action item to update the draft and get it in the T11 June mailing so that T11 can vote on it at their June T11 Plenary.

Schelto van Doorn gave a brief synopsis of a presentation given to the FC-0 group by Larry Bergman of JPL. Larry has a theory that a single high-powered pulse can be used to shepherd and synchronize a group of pulses launched at the same time but using different wavelengths. The problem normally encountered in WDM systems is that the different wavelengths travel at different speeds, resulting in skew at the receiving end. Larry's proposal would eliminate this skew. This is an interesting idea, but many years from fruition and commercialization ñ and while fascinating should not consume HIPPI-6400 meeting time.

6.7 Planning

The HIPPI-6400 Optics group's next meeting will be 2 PM to 5 PM on Tuesday, June 10, during the T11 Plenary week. The preliminary agenda for this meeting is:

1. Introductions
2. Selection of secretary
3. Approve / modify draft agenda
4. Review April 8 meeting minutes
5. Eye Safety
6. Open Fiber Control (OFC)
7. Electrical I/O specifications
8. Link Specification
9. Project Proposal status
10. Planning for future work

The HIPPI-6400-Optics meeting adjourned at 5 PM, and we reverted back to considering other issues.

7. HIPPI-ST

7.1 Review changes from Rev 0.4 → Rev 0.5

The changes in this March 31, 1997 revision were reviewed. Only the major and contentious issues that generated a lot of discussion are reported here.

The Notify flag bit was changed to "Silent". The text for Silent and the Interrupt flag were both changed. the First flag bit was changed to Last. These changes were reviewed and accepted.

The Transfer length (T_len) was changed from a 32-bit to a 64-bit parameter to support future large transfers. This required that the T_len parameter be removed from the CTS operation, but this wasn't deemed a loss since it was only advisory and not checked anyway.

In a like fashion, the Bufsize and Blocksize parameters were changed to 2^x where $8 \leq x \leq 64$ (the upper end had been 32 instead of 64). The Blocksize parameters in the Request_To_Send_Response and Clear_To_Send were also changed ñ they had stated that the Blocksize was the number of STUs in a Block. Greg Chesson noted that it was better to have Blocksize be an independent value rather than depending on another variable (STU size in this case). A warning note to alert people to the change will also be added.

The Operations descriptions in clauses 7 and 8 have been checked against tables 2 and 3. The text and tables have been made consistent. Don was requested to check that all of the uses of the different fields detailed in tables 2 and 3 are also detailed in clause 6.1.

Under the Request_To_Send operation it was noted that a combination of Request_To_Send and Clear_To_Send are necessary to pass all of the parameters necessary for Request_To_Send operations. Greg Chesson has an action item to provide some clarifying text to be added in clause 8.3, e.g., right before the "Semantics".

In clause 9, the Illegal Bufsize checks in 9.4.4 will also include a check to make sure that the value is not greater than 2^{64}. Before, it had just checked the lower value, i.e., less than 2^8, e.g., 256.

In 9.5.4 and 9.5.5, the errors actions for "Source_Concatenate not available" and "Persistent not available" were changed from "discarded" to "rejected". The open issue about how long Sources should keep their transmit buffers for possible retransmission was deleted as being not relevent.

7.2 HIPPI-FP as the lower layer (pages 29-30)

Annex A.2 was added for "HIPPI-FP" as the lower layer. It was based on a previous proposal by Craig Davidson. The text and figure were reviewed. The last portion of the second paragraph of A.2 was replaced with a note to the effect that the address mapping between HIPPI-800 and HIPPI-6400 has not been worked out, in particular for non-channel-attached devices. The HIPPI-ST data payload sizes in figures A.1 and A.2 will be changed from 2^{11} to 2^{31} (a typo).

7.3 Striping (pages 32-33)

Roger Ronald supplied the text and figures for striping that was placed in annex B. It was partially reviewed, but quickly had problems. The second paragraph of B.1 will be re-written. Then things went off the rails as we debated the procedures used to set up and use multiple channels. Don Tolmie proposed setting up the multiple channels with multiple Request_Port and Request_Port_Responses, in a very deterministic manner. Roger Ronald proposed a method that assumed uniform channels between the devices and tried to make use of them, but didn't set them up explicitly beforehand. No decision was made, but people were leaning more

towards Roger's method. This annex needs more work.

7.4 Support for less reliable media

In a previous e-mail, Richard Thomsen of Los Alamos questioned what he felt were some omissions in HIPPI-ST. Namely, if we intend -ST to be used over other media, e.g., Ethernet or long-haul, then we should also consider including some of the recent additions to TCP/IP. Richard viewed -ST as almost a replacement or peer for TCP/IP. Richard specifically mentioned Slow Start and Fast Recovery. Don Tolmie noted that HIPPI-ST has all of the hooks to do selective re-transmission, but we don't call it out explicitly.

Greg Chesson stated that he felt that the features would be needed if we were running -ST over IP, but didn't see an immediate need to do it, or a gain from doing it. Maybe someday.

7.5 Annex with Scheduled Transfer examples

James Hoffman, now with SGI, drafted a new annex, but agreed that it was not yet complete. Greg Chesson passed them out at the meeting, but unfortunately we did not have time to review it.

Greg also passed out a proposed Annex X written by Jeffrey Chung. It contained abbreviated state tables for the VC Connections State Machine, Receiver State Machine, and Transmit State Machine. Unfortunately, we did not have time to review it either. The question had been whether the level of detail was sufficient to be worth while.

7.6 Annexes describing other mappings, e.g., Ethernet

We have included mappings for using HIPPI-6400-PH and HIPPI-FP as the lower layers. It was questioned whether we also need to add mappings in Annex for other media, e.g., Ethernet. Greg Chesson took an action item to do a first draft of an Ethernet mapping.

7.7 Status of Project Proposal processing

The HIPPI-ST Project Proposal was forwarded to OMC and X3 by T11 at their February meeting. The Project Proposal was lost for a while in OMC, but is on their agenda for their May 6-8 meeting.

8. HIPPI-6400-SC

8.1 Review changes from Rev 0.9 → Rev 1.0

Roger Ronald led the discussion on the changes. Only the contentious ones that generated a lot of discussion are reported here.

There is a question on whether the Port selector fields within Admin micropackets are big-endian or little-endian. Roger Ronald has an action item to resolve it.

Don Tolmie noted that the format for the tables on page 3 needed to made consistent with Table 6, which is in the correct ANSI format. In figure 4, "Interface Chips" was replaced with "Link end elements". In table 8, the Cmnd values 80-FF were moved from "Reserved" to "Vendor unique". The Port numbers were reduced from 4 bytes to 2 bytes. It was noted that the proper designation for ANSI/IEEE 802.1d is also ISO/IEC 10038.

8.2 Broadcast

It was decided to remove the requirement that a switch also provide a broadcast capability. It was agreed that Rev 1.0 provides a usable broadcast capability, but may not be 100% suited for automatic topology discovery. It was agreed that if a spanning tree algorithm is used to direct broadcast operations then unicast operations would not be subject to the pruned topology derived from the spanning tree. The Port numbers will start at 1 rather than at 0; Port 0 will be used to invalidate a ULA.

9. IETF related items

9.1 IP over HIPPI, RFC 1374

John Renwick of Ascend recently reported via e-mail that "IP over HIPPI" has been assigned RFC 2067, obsoleting RFC 1374. John is the contact, at jkr@netstar.com. This is now a draft standard and no further processing should be needed; i.e., we're done!

9.2 ARP over HIPPI-800

Our previous ARP stuff for HIPPI-800 was dropped by the IETF due to lack of sufficient implementations. Michael McGowen took an action item to see if Phil Cameron could do some work on

ARP for HIPPI-800. It may be possible to leverage some of the HIPPI-6400 ARP work.

Fred Templin took an action item to work on an IEEE Tutorial for HIPPI-6400 ULA use. In the future this should be reported under IEEE items rather than IETF items.

9.3 HIPPI end-point MIB

Mark Kelley said that he will start working on the end-point MIB again.

9.4 HIPPI switch MIB

Michael McGowen distributed a copy of a HIPPI Switch MIB, version 1.0, developed by Marck Doppke of Essential Communications. Michael said that this MIB should work with current HIPPI-800 switches. Michael asked for everyone to review the MIB and pass comments back to Marck Doppke.

9.5 HIPPI-6400 MIB

Von Welch's "HIPPI 6400 End Point MIB" rev 0.3, based on HIPPI-6400-PH 0.9, had been available through the HIPPI Standards web page. People noted that the link did not seem to be currently working, and Don said that he would look into it. Von was not present at this meeting so there was nothing new to report.

Michael McGowen has an action item to try to coordinate the MIB developers and try for commonality.

9.6 HIPPI-6400 ARP and IP RFC

Greg Chesson and Fred Templin had an action item to develop an RFC for HIPPI-6400 ARP and IP. Greg reported that Jean-Michele Pittet of SGI will be the person doing the actual writing, and he should be starting soon. At this time ARP and IP will probably be in the same document. A separate document for IP over HIPPI-ST may also be developed.

10. HIPPI-800 topics

10.1 Publication of finished ANSI Standards

Don Tolmie reported that HIPPI-Serial, HIPPI-ATM, HIPPI-SC Revised have all completed their processing and are now approved ANSI standards. They are all in the publication phase and should be available from ANSI in the June time frame. The final document names (if you are referencing one of them in a paper), are:

ANSI X3.299-1997 High-Performance Parallel Interface ñ Mapping to Asynchronous Transfer Mode (HIPPI-ATM).

ANSI X3.300-1997 High-Performance Parallel Interface ñ Serial Specification (HIPPI-Serial)

ANSI X3.222-1997 High-Performance Parallel Interface ñ Physical Switch Control (HIPPI-SC)

Note that HIPPI-SC is a revision of X3.222-1993.

10.2 HIPPI-AC

There continues to be interest in pushing this topic, as an ANSI standard or as an HNF document, but nothing new was reported at this meeting. Michael McGowen has an action item to update the current document. Things are still on hold.

10.3 HIPPI API

Nothing new for this meeting. Currently we have SGI's character driver API (user level), and HP's device driver level API. SGI is also now doing a sockets level API for HIPPI-ST. Things are still cloudy, but in process.

10.4 HIPPI-MP

This project had been proposed as a way to achieve striping on HIPPI. With the advent of HIPPI Scheduled Transfer and its striping capability, there is no longer a need for HIPPI-MP.

Don Tolmie of Los Alamos moved, and Joe Parker of Optivision seconded, to take the necessary actions to have Project 1214-D, for HIPPI-MP, withdrawn. Motion passed: 9 for, 0 opposed, and 0 abstaining.

Don Tolmie took an action item to present this request to T11.

10.5 HIPPI-FP

We now have approved Project 702-R to revise HIPPI-FP. The original intent was to include a new ULP-id for HIPPI-MP (which is no longer needed).

10.5.1 ULP-id's needed

It was agreed to assign ULP-id = x'0C' for HIPPI-6400 encapsulation. This will be in addition to the existing ULP-ids already assigned in HIPPI-FP.

10.5.2 Other revision requests

Since the document is open to revision, Don had asked if there were other changes that people had identified. No additional items have been identified since the first call almost a year ago. Don was actioned to modify HIPPI-FP with this one technical change, and the editorial changes to date, and produce a finished document that we can forward.

11. Patents

11.1 Hewlett Packard patents

Hewlett-Packard previously supplied a letter defining HP's release of the 4b/5b coding for use in HIPPI-6400, and has been asked to complete the ANSI patent release form.   HP is also working on a release for the HIPPI-ST concepts. Francois was not at the meeting, but Greg Chesson said that the HIPPI-ST stuff is close to being completed.

11.2 Berg connector patents

Don Tolmie reported that he has received the signed ANSI Patent Form from Berg for the copper connector selected for HIPPI-6400-PH. Don has an open action item to forward the form to ANSI.

11.3 Call for other patents

A call is hereby issued for the existence of patents required to implement any and all HIPPI standards to be disclosed. It is necessary for the holders to agree to license those patents in conformance with the ANSI patent policy if the project on which they read is to proceed. T11 and the HIPPI group are not involved in this process at all.

The contact at ANSI is the General Counsel, Ms. Amy Marasco - (212) 642-4954 or amarasco@ansi.org. A patent policy description is at www.ansi.org/proctbl.html, section 1.2.11.

No new patent claims were made at this meeting.

12. Administrative matters

12.1 T11 reorganization letter ballot status

The T11 letter ballot to re-organize T11 passed by a vote of 55 for, 12 opposed, 5 abstentions, and 7 not voting. Comments were received with the NO votes. This matter will be discussed further in the T11 meeting that follows in a few days. *(See the T11 notes at the end of these minutes for more details.)*

13. Future meeting schedule

13.1 Interim HIPPI-6400 meeting, May 13-15, San Jose, CA

This interim meeting will cover HIPPI-6400 and HIPPI-ST issues. Discussion of copper issues will start at 1 PM on Wednesday, May 14th.

Tuesday, May 13 — 1 PM - 9 PM
Wednesday, May 14 — 8 AM - 9 PM (copper 1 PM)
Thursday, May 15 — 8 AM - 4 PM

The location is on the SGI campus. Greg Chesson and SGI are the host. There is no specific hotel for the meeting; attendees are on their own. (See the meeting announcement on the web page at http://www.cic-5.lanl.gov/~det/ for further details.)

13.2 Plenary week, June 9-10, Seattle, WA

During the T11 June plenary week , the following HIPPI meetings are scheduled:

Monday, June 9 -
  1 PM - 9 PM — HIPPI-6400

Tuesday, June 10 -
  8 AM - 2 PM — HIPPI-800 and -6400
  2 PM - 5 PM — HIPPI-6400 Optical
  6 PM - 9 PM — HIPPI-6400

The location is the Red Lion Hotel ñ Seattle Airport, Seattle, Washington. Mike Foster and Boeing are the host. (See the meeting announcement on the web page at http://www.cic-5.lanl.gov/~det/ for further details. Note that the reservation deadline is May 18.)

13.3 Future meeting dates and locations

The following 1997 T11 plenary week dates are shown below. Recent changes to this list are underlined to make them easier to find. T11 has changed their Plenary day to Thursday starting at the August meeting, but the October host was unsure if they could accommodate the same change. With the T11 Plenary move, Don Tolmie was able to move the HIPPI meetings to Tuesday and Wednesday during Plenary week, making it easier for people to attend without having to travel on the weekend.

1997 –

May 14-15	Interim	Mt. View	SGI
Jun 9-10	Plenary	Seattle, WA	Boeing
July 8-10	Interim	Minneapolis, MN	Cray
Aug 5-6	Plenary	Honolulu, HI	Hitachi
Sep 9-11 ??	Tentative	Mt. View, CA	SGI
Oct 6-7 ??	Plenary	Tucson, AZ	FSI
Nov 4-6	Tentative	??	??
Dec 9-10	Plenary	Orlando, FL	DPT

If interim September and November meetings are needed, SGI has agreed to host in Mountain View. Los Alamos and E-Systems had originally agreed to host in Albuquerque and Dallas, and may yet if scheduling time permits. Greg Chesson noted that the September dates may need to change due to a schedule conflict.

The 1998 schedule is less firm, but here is what is currently being considered by T11 for the plenary meetings. Question marks note the ones that are open. Hopefully HIPPI-6400 will be far enough along that we will not need interim working meetings.

1998 –

Feb 10-11	Plenary	San Diego	Qlogic
Apr 21-22	Plenary	Palm Springs, CA	Brocade
Jun 9-10	Plenary	St. Petersburg Beach, FL	AMP
Aug 11-12	Plenary	??	Hitachi ??
Oct 6-7	Plenary	Ft. Lauderdale, FL	Adaptec
Dec 8-9	Plenary	Tucson ??	??

14. Review action items

(The action items are grouped by project or category to hopefully make them easier to find.)

1. Don Tolmie to provide an updated HIPPI meeting attendees list.

2. Michael McGowen to suggest to HNF that if they desire a name change for the public name of HIPPI-6400 that they come up with suggestions.

3. Michael McGowen to send an electronic copy of their HIPPI-800 End-Point MIB to Tolmie for posting on the web.

4. Everyone to review the HIPPI-800 Switch MIB and pass comments to Marck Doppke.

5. Michael McGowen to coordinate the HIPPI MIB developers.

6. Von Welch to contact HIPPI-6400 MIB users and developers for comments on the current draft, and to prepare a presentation on the MIB for a future meeting.

7. Everyone to review the HIPPI-6400 MIB.

8. Fred Templin, Jeff Young, and Greg Chesson to begin an IP and ARP over HIPPI-6400 RFC.

9. Michael McGowen to pursue having Phil Cameron look at ARP for HIPPI-800.

10. Fred Templin to do an IEEE tutorial for ULAs on HIPPI-6400, and the ULAs special to HIPPI-6400.

11. Michael McGowen - Update HIPPI-AC to work with HIPPI-SC and its recent changes.

12. Everyone to suggest changes to HIPPI-FP and bring in proposals for them.

13. Don Tolmie to revise HIPPI-FP, X3.210-1992, with the ULP-id for HIPPI-6400 encapsulation and get the HIPPI-FP document ready to forward.

14. Don Tolmie to take the appropriate steps to kill the HIPPI-MP project.

15. Greg Chesson to propose text on the e-mail reflector describing HIPPI-ST Request_To_Receive set up using the Persistent bit.

16. Greg Chesson and Jeffrey Chung to look at methods for rejecting a HIPPI-ST Request_To_Receive Operation.

17. Greg Chesson and Jeffrey Chung to consider developing "reason codes" to explain why a particular HIPPI-ST Operation was rejected.

18. Greg Chesson to do a first draft of HIPPI-ST over Ethernet.

19. Jeffrey Chung to finish revising HIPPI-ST Annex C for the next revision of ST.

20. Greg Chesson and Jeffrey Chung to draft state tables for HIPPI-ST Operations.

21. Don Tolmie to update HIPPI-ST Rev 0.5 with the changes agreed to at the April meeting.

22. Greg Chesson to supply Don Tolmie and Roger Ronald with the layout of the OUI bits.

23. Fred Templin to make a PDF copy of the fabric structure that was used in the HIPPI-6400-SC broadcast discussions at the March meeting. Don Tolmie to put the PDF copy on the web site as an aid for further discussions.

24. Roger Ronald to determine whether the Port selector fields in Admin micropackets are big-endian or little-endian.

25. Roger Ronald to update HIPPI-6400-SC Rev 1.0 with the changes agreed to at the April meeting.

26. Don Tolmie to fix up the -PH service interface to support Admin micropackets in Transfer primitives, and to allow sending on all four VCs concurrently.

27. Greg Chesson and Fred Templin to check the Assigned Numbers RFC to see if there is an EtherType assignment for 802.1d, i.e., spanning tree, or should we use one of the HIPPI-6400-specific EtherTypes in HIPPI-6400-PH 7.2.

28. Greg Chesson to have SGI folks check the second paragraph of -PH 11.2 (about periodic re-training sequences failing), and inform Tolmie whether or not the paragraph should be deleted.

29. Hansel Collins to obtain the driver output impedance values for HIPPI-6400-PH table 9.

30. Hansel Collins and Herb Van Deusen to check the value of the blocking capacitor for driving the copper cable. There was concern expressed that 100 pF was not large enough.

31. Hansel Collins to determine if there are any placement restrictions on the blocking capacitor.

32. Hansel Collins to draft text to replace -PH table 8, which gave the values for the cable coupling network.

33. Hansel Collins to provide the transfer function for figure 20, i.e., what the cable sees.

34. Hansel Collins to finish the cable driver test jig, test cable system, and determine the Source driver's output impedance.

35. Hansel Collins to develop a skew budget for the copper cable interface and present it at the May meeting.

36. Michael McGowen to collect and tabulate everyone's requirements for HIPPI-800 and HIPPI-6400 translation environments.

37. Don Tolmie to update HIPPI-6400-PH Rev 1.2 with the changes agreed to at the April meeting.

38. Don Tolmie to update the draft HIPPI-6400-OPT Project Proposal and get it in the T11 June mailing.

39. Hansel Collins, Steve Joiner, and Dan Schwartz to come up with a pulse width distortion number for HIPPI-6400-PH table 9, or something equivalent, e.g., jitter.

40. Don Tolmie to do an initial draft of HIPPI-6400-OPT.

41. Dan Brown to write the first draft of the optical portion of the HIPPI-6400-OPT document.

42. Don Tolmie to make Dan Brown's optical draft available on the HIPPI web page.

15. Adjournment

The meeting adjourned at 9:30 PM on April 8. Note that on April 7, Monday, we met from 1 PM to 9 PM, and ordered in pizza so that we would not have to break the meeting for supper. On April 8, Tuesday, we met from 8 AM to 12:30 PM, took an hour and a half lunch break, and them met continuously from 2 PM to 9:30 PM. The attendees are to be complemented for their perseverance and dedication.

Notes from April T11 Plenary

The T11 Plenary met the next day, i.e., April 9. HIPPI related items are reported here for your convenience, the definitive record is the T11 minutes.

X3 has been renamed, they are now the National Committee for Information Technology Standards (NCITS). The Technical Committee responsible for HIPPI also had its name changed from X3T11 to T11. This last change is probably the one that most HIPPI folks will see, the other changes mainly show up in some of our boiler-plate. It is unknown if future standards will be X3.xxx or not.

NCITS is looking at tightening up Copyrights -- stay tuned for future developments. This may affect how we put approved standards on our web pages.

A vote to withdraw Project 1214-D, HIPPI-MP, passed by a roll-call vote of 58 For, 0 Opposed, and

21 not voting. T11 will take the appropriate actions to withdraw (and kill) the project.

T11 accepted the Project Proposal for HIPPI-6400-OPT, will put it in their June mailing, and vote on it at their June Plenary.

The T11 letter ballot on reorganizing T11 passed: 55 for, 12 opposed, 5 abstaining, and 7 not voting. There were comments from 13 voters. Nobody objected to establishing a TG for HIPPI. No significant objections were made to establishing a TG for Physical Variants. There is still a lot of discussion about how to organize Task Groups responsible for the remaining Fibre Channel projects - this was delayed for further study. T11 voted to establish T11.1, HIPPI, starting at the August meeting. T11.2, Physical Variants, was also established. These new Task Groups will be proposed to OMC by Roger Cummings, T11 Chairman; approval must be obtained before it will occur. If it occurs, then the August meeting will be the organizational meeting for T11.1, and all attendees will automatically become voting members of T11.1. After the August meeting, people will need to attend two consecutive T11.1 meetings to obtain voting membership. It is unclear when T11.1 members would be billed for membership.

The schedule for the August meeting in Honolulu was shifted by one day, HIPPI will now meet on Tuesday and Wednesday (August 5 and 6), 9 AM - 9 PM both days. The T11 plenary will follow on Thursday.

Attendance

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